PLANT MIX BITUMINOUS BASE COURSE
FIELD SECTION 301

301.1 Scop .**e** To establish procedures for mix design of plant mix bituminous base course. Ingredients for use in plant mix bituminous base course are to be inspected in accordance with the applicable sections of this Manual. Trial mix aggregate samples shall be submitted in accordance with Field Sec 1001 of this Manual. Plant calibrations, if requested shall be performed in accordance with General Sec 10 of this Manual. The inspection and acceptance procedures for bituminous mixture release agents shall be in accordance with Sec 1071 of this Manual.

301.2 Procedure . Mix design procedures are identical to those shown in Field Sec 403.2 of this Manual except that plant mix bituminous base is designed on the basis of 100 percent aggregate plus asphalt cement. If it becomes necessary to calculate a mix, the following formulas would be used:

Theometical maximum specific gravity of mix (0) shall be calculated as follows:

$$D = \frac{100 + \text{Percent Asphalt}}{A + B + C}$$

Where:

A = $\dfrac{\text{Percent of trial mix aggregate A in mix}}{\text{Combined specific gravity of trial mix Aggregate A}}$

B = $\dfrac{\text{Percent of trial mix aggregate B in mix}}{\text{Combined specific gravity of trial mix Aggregate B}}$

C = $\dfrac{\text{Percent of asphalt cement in mix}}{\text{Specific gravity of asphalt cement}}$

Theoretical maximum specific gravity of aggregate in a voidless mixture (D_1) shall be calculated as follows:

$$D_1 = \frac{100}{A + B}$$

d = Specific gravity of mix being calculated, picked from the curve of specific gravity versus the percent asphalt cement at the percent asphalt for which the mix is being calculated.

d_1 = $\left(\dfrac{d}{100 + \text{percent asphalt cement}} \right) / (100)$

= $d \times \dfrac{100}{100 + \text{percent asphalt cement}}$

Percent voids of the mixture (V) shall be calculated as follows:

$$V = \frac{D - d}{D} \times 100$$

DIVISION OF MATERIALS

Percent voids in mineral aggregate (VMA) shall be calculated as follows:

$$VMA = \frac{D_1 \times d_1}{D_1} \times 100$$

Percent aggregate voids filled with asphalt cement (VFAC) shall be calculated as follows:

$$VFAC = \frac{VMA - V}{VMA} \times 100$$

Stability: Stability of mix being calculated, picked from the curve of stability versus the percent asphalt cement at the percent asphalt for which the mix is being calculated.

301.3   Report.   A letter of transmittal will accompany the approved mixture to the District Engineer with distribution as follows:

Title	Copies of Letter of Transmittal	Copies of Approved Mix
District Engineer	1	2
Division Engineer, Const.	1	1
Operations Engineer	1	2
Resident Engineer	1	2
Physical Laboratory Director	2	2
Field Materials Director	1	1
File	1	1

A copy of the approved formula accompanied by a letter of transmittal from the District Engineer is to be forwarded to the contractor.

MoDOT DIVISION OF MATERIALS